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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,292	11/24/2003	Robert A. Cordery	F-714	4123
7590	07/10/2008		EXAMINER	ZHENG, JACKY X
Pitney Bowes Inc. Intellectual Property & Technology Law Department 35 Waterview Drive P.O. Box 3000 Shelton, CT 06484			ART UNIT	PAPER NUMBER
			2625	
			MAIL DATE	DELIVERY MODE
			07/10/2008	PAPER

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/720,292

Filing Date: November 24, 2003

Appellant(s): CORDERY ET AL.

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Ronald Reichman  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed on April 18, 2008 appealing from the Office action mailed November 21, 2007.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

2004/0105569 A1	Sharma et al.	07-2001
7,065,237	Murakami	12-2002
2003/0215112 A1	Rhoads et al.	06-2003

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

*Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claims 1 and 10** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

3. Claims 1 and 10 are *newly* amended with limitations of "*determining a correlation between the recovered watermark data for at least some of the data blocks and average brightness levels for said data blocks*" in step (e) of each claim indicated, and Appellant

indicated the places in the disclosure for the supports, such as: Paragraphs [0057] of original disclosure as stated in last paragraph on Page 10 of Appellant's "Remarks" filed on September 26, 2007. In consideration of the above-indicated places in the disclosure, Examiner has not found any *explicit* disclosure supporting the limitations of "average brightness levels for said data blocks", *rather*, the supports for "the brightness of the data block" and "calculating average gray scale value of the pixels in the data block" are disclosed in indicated paragraph of [0057]. In details, "average brightness level for said data blocks" and "average gray scale value of the pixels" are obviously referring to two different subjects to one of ordinary skill in the art, whereas first is referring to "average brightness level" with respect to "data block" and later is referring to "average gray scale value" with respect to "the pixel". Further, "data blocks" could comprise a plurality of pixels, but "data block" and "the pixels" are not equivalent at least in claim scope. Therefore, claims 1 and 10 are rejected for the abovementioned reasons, at least until the further clarification from Appellant indicating that such limitations are indeed being explicitly disclosed in the original disclosure at the time of the application filed or properly amend the claims in supports with original disclosure.

#### *Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5.     Claims 1-2, 4-5<sup>1</sup>, 9-13, 14-15 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Sharma et al. (U.S. Pub. No. 2004/0105569).

With regard to claim 1, the claim is drawn to a method of determining whether a printed-image-under-examination (PIUE) is a copy of an original printed image, the method comprising: (a) scanning the PIUE to generate scanned image data, the scanned image data comprising pixel data, the pixel data comprising gray scale values and representing the PIUE as a set of scanning pixels (*See Sharma et al., i.e. Figure 1, Block 100; paragraph [0053], disclose an representation of the original in form of digitized signal*); (b) forming a plurality of data blocks from the scanned image data, each data block consisting of pixel data which corresponds to a respective region of the PIUE (*See Sharma et al., i.e. Figure 6, Blocks 600, 602 & Paragraph [0091], disclose “the detector segments the target image into blocks”*); (c) transforming the pixel data in at least some of the data blocks to obtain transform domain data by applying at least one of a Fourier transform, a fast Fourier transform, a discrete cosine transform (DCT) and a wavelet transform to the pixel data in the at least some of the data blocks to obtain the transform domain data (*See Sharma et al., i.e. Figure 6, Block 604 & Paragraph [0091] discloses that after segmenting the target image into blocks, and “then performs a 2-dimensional fast Fourier Transform (2D FFT) on several blocks”; Paragraphs [0091] discloses performing a 2-dimensional Fast Fourier Transform to the image blocks; Paragraph [0073] also discloses the commonly known transform types, in both spatial or temporal domain*); (d) applying a watermark detecting operation to the transform domain data for respective ones of the data blocks to generate recovered watermark data (*See Sharma et al., i.e. Figure 6, Block 606 & Paragraph*

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<sup>1</sup> Correction for minor typographical error, replacing “Claims 1-2, 4, 9-13, 14-15 and 19” to “Claims 1-2, 4-5, 9-13, 14-15 and 19”.

{0092}); and (e) determining a correlation between the recovered watermark data for at least some of the data blocks and average brightness levels for said data blocks (*See Sharma et al.*, i.e. *Figure 6, Block 610 & Paragraph [0093]*, “performs a correlation”; additionally, i.e. *Paragraphs [0188]-[0206]*, discloses the usages of “orientation vectors” and extraction of luminance sample data in correlation process; & *Paragraph [0081]*).

**With regard to claim 2**, the claim is drawn to the method according to claim 1, further comprising: (f) determining that the PIUE is a copy of the original printed image if a strength of a brightness level of the recovered watermark data is negatively correlated with the brightness levels for said data blocks (*See Sharma et al.*, i.e. *Paragraphs [0201]*, “one figure of merits is the degree of correlation between a known watermark signal attribute and ...” and “another merit is the strength of the watermark signal”).

**With regard to claims 4 and 5**, claim 4 is drawn to the method according to claim 1, wherein the watermark detecting operation includes multiplying the transform domain data with a detecting function; and claim 5 is drawn to the method according to claim 4, wherein the detecting function is  $e^{ikr}$ , where k and r are phase space indices applicable to the transform domain data (*See Sharma et al.*, i.e. *Paragraph [0056]*).

**With regard to claims 9**, the claim is drawn to the method according to claim 1, wherein at least one the regions of the PIUE overlap with one or more other regions of the PIUE to which the data blocks correspond are overlapping with each other (*See Sharma et al.*, i.e. *Paragraph [0145]*).

**With regard to claims 10-11, 14-15 and 19**, the claims are drawn to a method of determining whether a printed-image-under-examination (PIUE) is a copy of an original printed

image, the original printed image including a watermark applied to the image using a plurality of wave vectors, the method comprising the *substantially identical* limitations recited in claims 1-5 and 9 *respectively*, and further drawn to using a plurality of wave vectors (*See Sharma et al.*, i.e. Paragraph [0056] discloses “watermarked signal vector”; Paragraphs [0118]-[0119], disclose “6D and 4D orientation vectors”).

**With regard to claim 12**, the claim is drawn to the method according to claim 10, further comprising: (f) determining that the PIUE is a copy of the original printed image if a signal level of the recovered watermark data is increases correlated with wavelengths of the wave vectors (*See Sharma et al.*, i.e. Paragraphs [0201], “one figure of merits is the degree of correlation between a known watermark signal attribute and ...” and “another merit is the strength of the watermark signal”).

#### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 6-7 and 16-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sharma et al.** as applied to claims 1-5, 9-15 and 19-22 above, and further in view of **Murakami (U.S. Patent No. 7,065,237)**.

With regard to claims 6-7 and 16-17, the claims further require the limitations of applying “an envelope function” to the transform domain data, and further applying “an inverse transform” to the results of the step mentioned above.

Sharma et al. do not *explicitly* disclose the limitation of applying so-called “envelope function” to the image signal in transform domain, yielding a result and further applying “an inverse transform” to the result.

However, Murakami discloses an invention relates to an image processing apparatus and method for embedding a digital watermark in a digital image and an image processing apparatus and method for extracting the embedded watermark from a digital image. More specifically, discloses the limitation of having “an envelope ring pattern generator” (*See Murakami, i.e. Figure 9, block 902*) for embedding an envelope ring pattern in a Fourier amplitude spectrum on basis of the Fourier amplitude generated by Fourier Transformer (*i.e. Figure 9, block 901*); An “Inverse Fourier Transformer”(*i.e. Figure 9, block 904*) is also disclosed for applying the “inverse Fourier Transform” to the previous results (*For details, column 8, line 47 – column 9, line 60*).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have modified Sharma et al. to include the limitation of applying so-called “envelope function” to the image signal in transform domain, yielding an result and further applying “an inverse transform” to the result taught by Murakami. It would have been obvious to one of ordinary skill in the art at the time of invention to have modified Sharma et al. by the teachings of Murakami to include the limitation of applying so-called “envelope function” to the image signal in transform domain, yielding an result and further applying “an inverse transform”

to the result taught by Murakami, in order to obtain an image with digital watermark information embedded to be “imperceptible or nearly imperceptible to the human eye...” (*See Murakami, i.e. column 9, lines 36-37.*)

8. **Claims 8 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharma et al. as applied to claims 1-7, 9-17, 19-22 and 25 above, and further in view of Rhoads et al. (U.S. Pub. No. 2003/0215112).

With regard to claims 8 and 18, the claims are drawn to the method according to claim 1 and claim 10 respectively, wherein the PIUE is part of postal indicia.

Sharma et al. do not *explicitly* disclose the limitation of the original printed image being postal indicia.

However, Rhoads et al. disclose the limitation of the original printed image being postal indicia (*see Rhoads et al., i.e. Paragraph [0118]*).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have modified Sharma et al. to include the limitation of the original printed image being a postal indicia taught by Rhoads et al. It would have been obvious to one of ordinary skill in the art at the time of invention to have modified Sharma et al. by the teachings of Rhoads et al. to the limitation of the original printed image being a postal indicia taught by Rhoads et al. for *at least* the reasons of both prior arts of record are related and solving the problems in the identical field of arts, watermarking (or data hiding, data embedding, digital watermarking, steganography).

**(10) Response to Argument**

1. For purposes of clarity and consistency of record for consideration at BPAI, Examiner respectfully point out that, in section "VI. Grounds of Rejection to be Reviewed on Appeal" of appeal brief, the second ground of rejection, "B. Whether or not claims 1-2, 4, 9-13, and 14-15 are ..." should be corrected with "B. Whether or not claims 1-2, 4-5, 9-13, and 14-15 are ...".
2. Appellant's arguments filed on April 18, 2008 have been carefully and fully considered but they are not persuasive for at least the following reasons.
3. In re Appellant's arguments (Argument A) presented on Pg. 7-8 of the appeal brief, regarding the rejection made under 35 U.S.C. §112, first paragraph with regard to Claims 1 and 10, Appellant asserts that "*there is support in paragraph [0057] for the expression 'average brightness levels for said data blocks' in step (e) of claims 1 and 10 ... the average brightness level is the same as the brightness level because it has the same numeric value ... The term average is included in claim 1 and 10 to clarify that the brightness level for each data block is an average of pixel gray scale values*". Appellant's argument(s) are fully considered, however found to be not persuasive for at least the following reasons.

- a. First, Examiner acknowledges that as disclosed in Paragraph [0057] of instant specification, "the brightness of the data blocks" (first part) may be done "by calculated an average gray scale value of the pixels in the data block" (second part). However, there is still no supporting disclosure of specific claim limitation of "average brightness levels for said data blocks". In details, the first part of "the brightness of the data blocks" are simply referring the brightness of the data blocks by its plain meaning with neither teachings nor indication of *computation of averaging* specifically relating to the data

block, whereas the second part, discloses the teachings of averaging of *gray value* specifically relating to *the pixels* in the data block. Therefore, the specific claim limitation of "... average brightness levels for said data blocks" recited in the claims is clearly not equivalent to what is disclosed in the original disclosure of "an average gray scale value of the pixels in the data block" as alleged by Appellant in Para. [0057].

b. Second, as continuation of the above, "average brightness levels for said data blocks" would be interpreted in its plain meaning by one of original skill in the art (considering there is no specific controlling definition given in the original disclosure or indicated by Appellant relating to such claim limitations and to provide a different interpretation of such other than the ones by its plain meanings), to be the calculated average of brightness among the data blocks, whereas, "average gray scale value for the pixels in the data block", would be interpreted in its plain meaning by one of original skill in the art, to be the calculated averaged gray scale value among the pixels in a single data block.

c. Finally, Appellant's argument of "...*the term 'average' is included in claims 1 and 10 to clarify that the brightness level for each data block is an average of pixel gray scale value.*..." (in 1<sup>st</sup> Para. of Pg. 8 in the brief), such argument is also carefully considered, however respectfully found to not persuasive. Again, claims recite specifically, among other limitation, "... average brightness levels for said data blocks", whereas there is no recitation of alleged interpretation of "average" being "an average of pixel gray scale value", in fact the limitation of processing "pixel gray scale value" is not even being explicitly recited in the claim. Therefore, Examiner respectfully submits that Appellant's

argument of equivalency of the insertion of the word "average" in front of "brightness level for said data blocks" with the alleged interpretation of "the brightness level for each data block is an average of pixel gray scale value" (in Para. [0057] of Specification) is not persuasive, and is deemed to be an example of improper reading of limitations from the Specification into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Therefore, Examiner respectfully submits, for at least the reasons set forth above, the ground of rejection made under 35 U.S.C. §112, first paragraph with regard to Claims 1 and 10 is deemed to be proper, and respectfully submitting to be sustained.

4. In re Appellant's arguments (Argument B) presented on Pg. 8-13 of the appeal brief, regarding the rejection made under 35 U.S.C. §102(e) with regard to Claims 1-2, 4-5, 9-13, 14-15 and 19, Appellant asserts that Sharma "does not disclose or anticipate step (e) of claim 1 ... determining a correlation between the recovered watermark data for at least some of the data blocks and average brightness levels for said data block" and further asserts, "Sharma does not disclose or anticipate step (e) of claim 10, ... (i) a correlation between the recovered watermark data for at least some of the data blocks and average brightness levels for said data blocks, and (ii) a correlation between the recovered watermark data and the wave vectors". Appellant's argument(s) are fully considered, however found to be not persuasive for at least the identical reasons set forth in office action mailed on November 21, 2007, specifically in Paragraph 15, and

in the advisory action mailed on February 5, 2008, reproduced herein with further discussion provided as below:

- a. First, with regard to claim 1, the limitation of "*determining a correlation between the recovered watermark data for at least some of the data blocks and average brightness levels for said data blocks*", as also indicated previously in the office action mailed on June 27, 2007, in Sharma et al., i.e. Figure 6, Block "610" illustrates a function block of "Correlation", and Paragraph [0093] discloses the limitation of "performs a correlation between the transformed image block ...."; further, Paragraphs [0188] – [0206], specifically in Paragraph [0188] discloses the usages of orientation vectors and extraction of luminance sample data (or brightness) in correlation process.
- b. Second, with regard to claim 10, the limitation of "*determining at least one (i) a correlation between the recovered watermark data for at least some of the data blocks and average brightness levels for said data blocks, and (ii) a correlation between the recovered watermark data and the recovered watermark data and the wave vectors*", as also indicated previously in the office action mailed on June 27, 2007, in addition to the discussion of limitation (i) in claim 1 above, Sharma et al. i.e. Paragraph [0056] discloses "watermarked signal vector"; Paragraph [0188]-[0190] discloses the limitations and usages of "6D orientation vectors" and "4d orientation vectors" and according to Appellant's disclosure provides that "wave vectors" claimed to be referring to a set of parameters that define a wave length and an orientation ...." (*see instant Specification, Para. [0059]*).

Therefore, Examiner respectfully submits, for at least the reasons set forth above, the ground of rejection made under 35 U.S.C. §102(e) over Sharma et al. is deemed to be proper, and respectfully submitting to be sustained.

5. In re Appellant's arguments (Argument C) presented on Pg. 13-14 of the appeal brief, with regard to Claims 6-7 and 16-17, Appellant asserts that "Sharma and Murakami, taken separately or together, do not disclose or anticipate step (e) of claim 1 and 10...". Appellant's argument(s) with relating to step (e) of claims 1 and 10 are fully considered, however found to be not persuasive for at least the *identical* reasons set forth above (in section of Argument B). Therefore, Examiner respectfully submits, for at least the reasons set forth above, the grounds of rejection made under 35 U.S.C. §103(a) over Sharma et al. and Murakami with regard to claims 6-7 and 16-17 is deemed to be proper, and respectfully submitting to be sustained.

5. In re Appellant's arguments (Argument D) presented on Pg. 14 of the appeal brief, with regard to Claims 8 and 18, Appellant asserts that "Sharma and Rhoads, taken separately or together, do not disclose or anticipate step (e) of claim 1 and 10...". Appellant's argument(s) are fully considered, however found to be not persuasive for at least the *identical* reasons set forth above. Therefore, Examiner respectfully submits, for at least the reasons set forth above, the grounds of rejection made under 35 U.S.C. §103(a) over Sharma et al. and Rhoads et al. with regard to claims 8 and 18 is deemed to be proper, and respectfully submitting to be sustained.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Jacky X. Zheng/

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Examiner, Art Unit 2625  
July 10, 2008

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